WISCONSIN DEPARTMENT OF PUBLIC INSTRUCTION

Inequitable Distribution of Teachers Report: Technical Guide

Data Definitions

Teaching Assignments

Eligible teaching assignments are defined as any assignment that is filled by:

- a teacher (POSITION CODE 53),
- a teacher-in-charge (POSITION CODE 19),
- a speech/language pathologist (POSITION CODE 84),
- a librarian (POSITION CODE 86),
- a library media specialist (POSITION CODE 87), or
- an instructional technology integrator (POSITION CODE 88)

and has more than 0.0 FTE (with 1.0 being full time).

A list of current POSITION CODES and descriptions are available at https://dpi.wi.gov/wise/data-elements/position-code

More information about how DPI collects data on FTE is available at https://dpi.wi.gov/wise/data-elements/fte

Inexperience

Inexperienced teachers are defined as possessing fewer than three (3) years of experience teaching in their subject area prior to the report year. Three years was selected as the threshold because there is meaningful variation across schools and this initial period is critical for supporting and retaining teachers. Additionally, significant research focuses on three or fewer years of experience as a measure of inexperience among teachers.

A list of subject area (AREA CODE OF ASSIGNMENT) codes and descriptions can be found at https://dpi.wi.gov/wise/data-elements/area-code-assignment.

Out-of-field or Ineffective

Out-of-field teachers in Wisconsin are defined as educators who already hold a teaching license but are in an assignment out of their license area. They are currently teachers of record with an emergency license and enrolled in a program working towards full licensure in the new assignment area.

Ineffective teachers in Wisconsin are defined as educators with a bachelor's degree and no educator preparation. They are currently teachers of record on an emergency permit and enrolled in an educator preparation program working towards full licensure. They are not considered highly qualified. In order to receive an emergency permit, a candidate only has to demonstrate the receipt of bachelor's degree in the subject area. A permit must be renewed annually and the candidate must enroll in a program leading to full licensure.

The out-of-field/ineffective metric is the sum the FTE of those assignments staffed by individuals who are defined as out-of-field or ineffective. This is an important measure of equity, as Wisconsin believes strongly in the need for teachers to possess both content and pedagogical knowledge. This is reflected in our Wisconsin pathways to full licensure. Separating out-of-field and ineffective teachers into their own metrics would result in numbers that are too small to result in any meaningful analysis.

Students of Color

A student of color is any student who identifies as Hispanic or Latina/o and/or as American Indian - Alaskan Native, Asian, Black - African American, Native Hawaiian - Pacific Islander, Two or More Races.

More information about how DPI collects race-ethnicity data can be found at https://dpi.wi.gov/wise/data-elements/race.

Economic Disadvantage

An economically disadvantaged student is one who is:

- identified by Direct Certification -OR-
- a member of a household that meets the income eligibility guidelines for free or reduced-price meals (less than or equal to 185 percent of Federal Poverty Guidelines) under the National School Lunch Program (NSLP) -OR-
- identified by an alternate mechanism, such as the alternate household income form.

More information about economic disadvantage status can be found at https://dpi.wi.gov/wise/data-elements/econ-status.

Minimum Number of Teaching Assignments

Schools with fewer than 20 teaching assignments are not included in the calculations used to identify schools that disproportionately contribute to statewide inequality because percentages are too erratic when the underlying counts fall below this threshold.

How Schools are Identified

Schools are identified if they disproportionately contribute to statewide inequality on at least one of the four metrics defined in our ESSA state plan (https://dpi.wi.gov/esea/wisconsin-consolidated-state-plan):

- students of color being taught be inexperienced teachers,
- students of color being taught by out-of-field or ineffective teachers,
- economically disadvantaged students being taught be inexperienced teachers, or
- economically disadvantaged students being taught by out-of-field or ineffective teachers.

Intuition Behind Identification Process

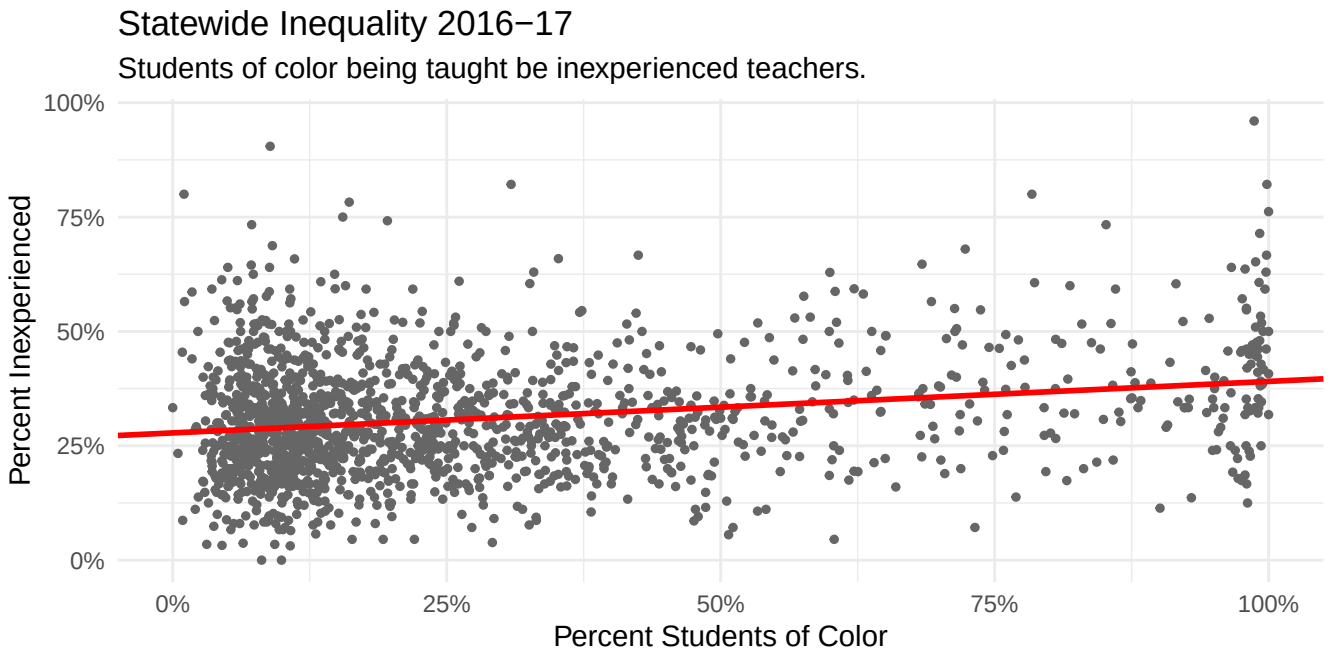
Unlike other metrics that deal with disproportionality, there is no absolute threshold or level that will trigger whether a school is identified or not. Instead, the metric that we have chosen is relative to the fractions of:

- economically disadvantaged students,
- students of color,
- inexperienced teachers, and
- out-of-field/ineffective teachers

in each school *and* how that school compares to schools across the rest of the state.

For the sake of explanation, let's consider the first metric described above, inexperienced teachers and students of color. Each gray dot in the graph below represents one school. The horizontal axis is the fraction of students of color at the school and the vertical axis is the fraction of that school's total FTE staffed by inexperienced teachers.

We define staffing inequality as the slope of the red regression line, also known as the line of best fit, that describes the relationship between the fraction of total FTE staffed by inexperienced teachers and the fraction of students of color across schools in Wisconsin. A steeper line implies higher inequality and a flatter line implies lower inequality.



The metric that we have chosen allows us to identify the schools that have the greatest influence on making the slope of the line as steep as it is. These schools are in the upper right-hand corner, above the red regression line, in the graph above.

The rationale behind this process is: if we can bring the number of inexperienced teachers in these schools down, we can eliminate the statewide association between students of color and inexperienced teachers, i.e. bring the slope of the regression line closer to zero.

Technical Details

DPI uses a linear regression model to identify schools that contribute the most to statewide inequality. Four separate regression models are used, one for each combination of teacher and student population. For out-of-field/ineffective assignments, the models include a squared term to account for the nonlinear increase in emergency credentials as schools' fractions of economically disadvantaged students and students of color increase.[1]

The slope of the regression line is the extent of inequality in teacher assignments statewide — the degree to which the characteristics of the students are associated with the characteristics of the teachers. If teachers were distributed equitably, then the slope would be zero.

To identify individual schools, DPI determined the degree to which each school contributed to the statewide inequality, represented by the slope of the regression line. The DFBETA statistic, a measure of the degree of contribution of a given observation to the slope of the regression line, is computed for each school.[2] Schools with over 60 percent economically disadvantaged students or 30 percent students of color that were at or above the 85th percentile on the DFBETA statistic, were identified as disproportionately contributing to the statewide inequity. If we were to bring these schools to the Wisconsin average in the percentage of inexperienced or out-of-field/ineffective staff, the slope of each regression line would be zero.

Data Sources

Student data come from WISEdata. Student counts and percentages for both student subgroups are calculated based on students who enrolled on the Third Friday of September count date.

Teacher data come from the audited WISEstaff/PI-1202 reports, depending on the year. Schools will have NA values in the school detail tables for those years in which they did *not* complete the entire audit process, see https://dpi.wi.gov/tepdl/licensing/audit for more details on the audit process.

NOTE: We do not include any data from the 2014-15 school year because some of the teacher data elements are not available.

Data Disclaimer

The Department of Public Instruction (DPI) has made a reasonable effort to ensure that the accompanying information is up-to-date, accurate, complete, and comprehensive at the time of disclosure. These records reflect data as reported to this agency by the educational community we serve for the reporting period indicated. These records are a true and accurate representation of the data on file at the DPI. Authenticated information is accurate only as of the time of validation and verification. The DPI is not responsible for data that is misinterpreted or altered in any way. Derived conclusions and analyses generated from this data are not to be considered attributable to the DPI.

[1] The equation is slightly more complicated. The percentage of teaching assignments that are inexperienced or out-of-field/ineffective and the percentage of students in the student category are both logged. Additionally, the model is fit separately for each school year the DPI has data to account for secular changes over time in the level of teacher preparation, experience, and distribution.

[2] The DFBETA for a predictor and for a particular observation is the difference between the regression coefficient calculated for all of the data and the regression coefficient calculated with the observation deleted, scaled by the standard error calculated with the observation deleted.